

CLAIMS

1. An electrode of a solid oxide fuel cell wherein:
the electrode comprises a skeleton constituted of a porous
5 sintered compact having a three dimensional network structure,
the porous sintered compact being made of an oxide ion
conducting material and/or a mixed oxide ion conducting
material;

grains made of an electron conducting material and/or
10 a mixed oxide ion conducting material are adhered onto the
surface of said skeleton; and

said grains are baked inside the voids of said porous
sintered compact under the conditions such that the grains
are filled inside the voids.

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2. The electrode of a solid oxide fuel cell according
to claim 1, wherein said porous sintered compact is made of
a material which has a composition represented by the following
formula:

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$$\text{Ln}_{1-x}\text{A}_x\text{Ga}_{1-y-z}\text{B}_1\text{B}_2\text{O}_3 \quad \dots (1)$$

where

Ln = one or more of La, Ce, Pr, Nd and Sm;

A = one or more of Sr, Ca and Ba;

B_1 = one or more of Mg, Al and In;

25 B_2 = one or more of Co, Fe, Ni and Cu;

x = 0.05 to 0.3;

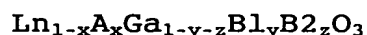
y = 0.025 to 0.29;

z = 0.01 to 0.15; and

$$y + z \leq 0.3.$$

3. The electrode of a solid oxide fuel cell according to claim 1, wherein said porous sintered compact is made of
5 a yttria stabilized zirconia.

4. The electrode of a solid oxide fuel cell according to claim 1, wherein said porous sintered compact is made of a material having a composition represented by the following
10 formula, and the electrode is an air electrode:



where

Ln = one or more of La, Ce, Pr, Nd and Sm;

A = one or more of Sr, Ca and Ba;

15 B1 = one or more of Mg, Al and In;

B2 = one or more of Co, Fe, Ni and Cu;

x = 0.05 to 0.3;

y = 0 to 0.29;

0.15 < z ≤ 0.3; and

20 y + z ≤ 0.3.

5. The electrode of a solid oxide fuel cell according to claim 1, wherein said porous sintered compact is made of a material having a composition represented by the following
25 formula, and the electrode is an air electrode:



where

A' = one or more lanthanoid metals each having the 8 coordination ionic radius of the trivalent ion ranging from 1.05 to 1.15 Å;

B' = one or more of Co, Fe, Ni and Cu;

5 x' = 0.05 to 0.3; and

y' = 0.05 to 0.3.

6. The electrode of a solid oxide fuel cell according to any of claims 1 to 3, wherein said grains comprise at least
10 one of Ni, Co, $Ce_{1-m}CmO_2$ (C is one or more of Sm, Gd, Y and Ca; m = 0 to 0.4), and the electrode is a fuel electrode.

7. The electrode of a solid oxide fuel cell according to any of claims 1 to 5, wherein said grains are made of at
15 least one selected from a group of the materials based on $LaMnO_3$, $LaCoO_3$, $SmCoO_3$ and a $PrCoO_3$, and the electrode is an air electrode.

8. An electrode/electrolyte laminate for a solid oxide
20 fuel cell, wherein the electrode according to any of claims 1 to 7 is integrally formed on one surface of an oxide ion conducting, dense solid electrolyte layer.

9. An electrode/electrolyte laminate for a solid oxide
25 fuel cell, wherein the electrode according to any of claims 1 to 3 is integrally formed on both surfaces of an oxide ion conducting, dense solid electrolyte layer.

10. An electrode/electrolyte laminate for a solid oxide fuel cell, wherein the electrode according to any of claims 1 to 5 or claim 7 is integrally formed on one surface of an oxide ion conducting, dense solid electrolyte layer; and the
5 electrode according to any of claims 1 to 3 or claim 6 is integrally formed on the other surface of the oxide ion conducting, dense solid electrolyte layer.

11. The electrode/electrolyte laminate for a solid oxide
10 fuel cell according to any of claims 8 to 10, wherein the skeleton of the electrode and the solid electrolyte layer are made of the same material or the same type of material.

12. A solid oxide fuel cell, wherein the fuel cell
15 comprises an air electrode and/or a fuel electrode each consisting of the electrode according to any of claims 1 to 7.

13. A solid oxide fuel cell, wherein the fuel cell
20 comprises the electrode/electrolyte laminate according to any of claims 8 to 11.